CLAIMS

What is claimed is:

1. A encoding method of record medium, for modulating a sequence of original data of m digits as a sequence of digital data of n digits, the encoding procedures of the method involving accessing the original data of the m digits after setting an initial type, obtaining a corresponding set value (i) after the original data of the m digits is transformed, and searching a corresponding digital set (Si) in a digital table, then obtaining a unique digital vector (Vj) in the digital set via a sieve procedure, picking the digital data of the n digits of the digital vector, finally outputting the encoding results, the digital data of the n digits be output to the record medium to store after repeating the encoding procedures, said method comprising the steps of :

accessing the original data of the m digits;

transforming the original data of the m digits into the set value, and searching the corrseponding digital set in the digital table;

processing the sieve of the digital vector;

outputting the digital data of the n digits; and

generating a write-in signal;

wherein when satisfying the conditions of the step of accessing the original data of the m digits, the method continuing the encoding procedures; when unsatisfying the conditions of the step of accessing the original data of the m digits, the method terminating the encoding procedures.

2. The encoding method according to claim 1, wherein the values of the m, n, i, and j are integrals.

3. The encoding method according to claim 1, wherein m equals 8, and n equals 15.

4. The encoding method according to claim 1, wherein the digital table satisfies the conditions of including 2m digital set (Si).

5. The encoding method according to claim 4, wherein conjunction of any two sets of the digital set (Si) is an empty set.

6. The encoding method according to claim 1, wherein the digital set (Si) at least comprises a digital vector (Vj) and the digital set (Si) is expressed as:

Si = {[digital vector (Vj)], [digital vector (Vj+1)],...}.

7. The encoding method according to claim 1, wherein the digital vector (Vj) comprises the digital data of the n digits, a type, and a forbidden type set and is expressed as:

Vj=[digital data of n digits, type, forbidden type set].

8. The encoding method according to claim 7, wherein when the digital data of the n digits of the digital vector (Vj) is the same, the type of which is different.

9. The encoding method according to claim 7 wherein when the digital data of the n digits of the digital vector (Vj) is the same, the forbidden type set of which is the same.

10. The encoding method according to claim 1, wherein the digital vector (Vj) comprises the digital data of the n digits and the type, and is expressed as:

Vj=[digital data of n digits, type].

11. The encoding method according to claim 7, wherein the forbidden type is determined by the number of an ending '0' after a last '1' in the digital data of n digits.

12. The encoding method according to claim 11, wherein when the number of the last '0' is 0, 1, 7, 8, 9, 10, or 11, the type is categorized to type A, when the number of the last '0' is 2, 3, 4, 5, or 6, the type is categorized to type B and type C.

13. The encoding method according to claim 7, wherein the forbidden type set is a set having at least one element of the type.

14. The encoding method according to claim 7, wherein the definition of the forbidden type set is determined by the number of a leading '0' before a first '1' in the digital data of n digits.

15. The encoding method according to claim 14, wherein when the number of the leasing '0' is 0, 3, or 5, the type is defined as {B}, when the number of the leading '0' is 1, 2, 4 or 6, the type is defined as {C}.

16. The encoding method according to claim 14, wherein when the number of the leasing '0' is 0 or 2, the type is defined as {B}, when the number of the leading '0' is 1, 3, 4, 5, or 6, the type is defined as {C}.

17. The encoding method according to claim 1, wherein the step of processing the sieve of the digital vector further comprises steps of:

accessing the dagital data of the n digits of the digital vector on by on for verifying;

resvering the digital vector satisfying a combination constraint;

accessing the forbidden type set of the digital vector on by on for verifying;

reserving the digital vector which satisfies a dependent relationship;

calculating the digital vector's digital sum value according to look-ahead words;

determining the digital vector; and

pikcing the corresponding digital data of the n digits.

18. The encoding method according to claim 17, wherein the combination constraint is DK-Constraint, i.e., (d, k) constraint, which indicates the number of '0' between any two '1' is between d that is an integral not smaller than 0 and k that is an integral not smaller

than d.

19. The encoding method according to claim 18, wherein d equals 2, and k equals 12.

20. The encoding method according to claim 17, wherein , wherein the dependent relationship indicates that the conjunction of the type of the former digital vector (Vj-1) and the forbidden type set of the digital vector (Vj) is an empty set.

21. The encoding method according to claim 17, wherein the look-ahead words indicates the needing number of picking the digital vector when calculating the digital sum value (DSV).

22. The encoding method according to claim 17, wherein the step of determining the digital vector indicates selecting the minimum among the absolute values of the digital sum value.

23. The encoding method according to claim 1, wherein the step of generating a write-in signal is by way of Non-Return to Zero Inverted (NRZI) modulation.

24. A decoding method of record medium, for modulating a sequence of digital data of n digits as a sequence of original data of m digits, the decoding procedures of the method involving searching a corresponding digital vector of the digital data of the n digits in the digital table, obtaining a unique digital vector after a comparing procedure, determining a corresponding digital set (Si) of the digital vector, outputting the corresponding set value (i) as the decoding result, for obtaining sequence of original data of m digits after repeating decoding procedures, said method comprising the steps of :

accessing the digital data of the n digits;

searching same digital data of the n digits in the digital table;

when there being miltipe same sigital vector, further comprising the steps of:

accessing a type of the digital vector;

accessing next n-digit digital data and determining the forbidden type set value;and

determining the digital vector;

executing the decoding procedure of the digital vector;

transforming a correspondent set value; and

outputting the set value;

wherein when satisfying the conditions of the step of accessing the digital data of the n digits, the method continuing the decoding procedures; when unsatisfying the conditions of the step of accessing the digital data of the n digits, the method terminating the decoding procedures.

25. The decoding method according to claim 24, wherein the values of the m, n, i, and j are integrals.

26. The decoding method according to claim 24, wherein m equals 8, and n equals 15.

27. The decoding method according to claim 24, wherein the digital table satisfies the conditions of including 2m digital set (Si).

28. The decoding method according to claim 27 wherein conjunction of any two sets of the digital set (Si) is an empty set.

29. The decoding method according to claim 24, wherein the digital set (Si) at least comprises a digital vector (Vj) and the digital set (Si) is expressed as:

Si = {[digital vector (Vj)], [digital vector (Vj+1)],...}.

30. The decoding method according to claim 24, wherein the digital vector (Vj) comprises the digital data of the n digits, a type, and a forbidden type set and is expressed as:

Vj=[digital data of n digits, type, forbidden type set].

31. The decoding method according to claim 30, wherein when the digital data of the n digits of the digital vector (Vj) is the same, the type of which is different.

32. The decoding method according to claim 30, wherein when the digital data of the n digits of the digital vector (Vj) is the same, the forbidden type set of which is the same.

33. The decoding method according to claim 24, wherein the digital vector (Vj) comprises the digital data of the n digits and the type, and is expressed as:

Vj=[digital data of n digits, type].

34. The decoding method according to claim 30, wherein the forbidden type is determined by the number of an ending '0' after a last '1' in the digital data of n digits.

35. The decoding method according to claim 34, wherein when the number of the last '0' is 0, 1, 7, 8, 9, 10, or 11, the type is categorized to type A, when the number of the last '0' is 2, 3, 4, 5, or 6, the type is categorized to type B and type C.

36. The decoding method according to claim 30, wherein the forbidden type set is a set having at least one element of the type.

37. The decoding method according to claim 36, wherein the definition of the forbidden type set is determined by the number of a leading '0' before a first '1' in the digital data of n digits.

38. The decoding method according to claim 36, wherein when the number of the leasing '0' is 0, 3, or 5, the type is defined as {B}, when the number of the leading '0' is 1, 2, 4 or 6, the type is defined as {C}.

39. The decoding method according to claim 36, wherein when the number of the leasing '0' is 0 or 2, the type is defined as {B}, when the number of the leading '0' is 1, 3, 4, 5, or 6, the type is defined as {C}.

40. The decoding method according to claim 24, wherein the step of determining the digital vector indicates that selecting an empty set which is the conjunction of the type and the forbidden type set.